

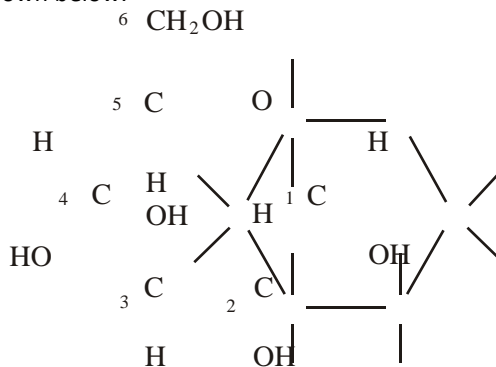
TBD05 – IB Review Questions 2

Name

1. (a) Draw the straight chain structure of glucose.

(1)

- (b) The structure of α -glucose is shown below.



Outline the structural difference between α -glucose and β -glucose.

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(1)

- (c) Glucose molecules can condense to form starch which can exist in two forms, amylose and amylopectin. Describe the structural differences between the two forms.

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(2)

- (d) 1.00 g of sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, was completely combusted in a food calorimeter. The heat evolved was equivalent to increasing the temperature of 631 g of water from 18.36°C to 24.58°C . Calculate the calorific value of sucrose (in kJ mol^{-1}) given the specific heat capacity of water in Table 2 of the Data Booklet.

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(3)

(Total 7 marks)

2. When many amino acid molecules react together a protein is formed. These proteins have primary, secondary and tertiary structures.

- (i) State the type of intermolecular force responsible for maintaining the secondary structure.

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(1)

- (ii) State **two** other ways in which the tertiary structure of the protein is maintained.

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(2)

(Total 3 marks)

3. (a) State the empirical formula of all monosaccharides.

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(1)

- (b) The structural formula of lactose is shown in Table 22 of the Data Booklet.

- (i) Deduce the structural formula of **one** of the monosaccharides that reacts to form lactose and state its name.

(2)

- (ii) State the name of the **other** monosaccharide.

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(1)

- (c) State **two** major functions of polysaccharides in the body.

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(2)

(Total 6 marks)

4. The structural formulas of cholesterol and testosterone are shown in Table 22 of the Data Booklet.

- (a) Identify the class of compound to which cholesterol and testosterone belong.

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(1)

- (b) State the names of **two** functional groups present in both cholesterol and testosterone.

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(2)

- (c) Cholesterol and testosterone both contain a five-membered ring as part of their structures. Deduce the total number of hydrogen atoms joined directly to the carbon atoms in this ring.

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(1)

(Total 4 marks)

5. By referring to Table 22 of the Data Booklet, identify **one** vitamin that is water soluble and **one** vitamin that is fat soluble. Explain the differences in solubility in terms of their structures and intermolecular forces.

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(Total 4 marks)